LATE ANGIOGRAPHIC RESULT OF USING THE RIGHT GASTROEPIPLOIC ARTERY AS A GRAFT

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Objective: The angiographic patency of the right gastroepiploic artery graft used for coronary artery bypass grafting was studied during the late (5-10 years) postoperative period.

Methods: Among 936 patients undergoing a gastroepiploic artery graft for coronary artery bypass grafting between 1986 and 1999, postoperative angiographic restudy was conducted on 685 patients within 1 year (mean, 2.2 months), on 102 patients between 1 and 5 years (mean, 2.3 years), and on 52 patients between 5 and 10 years (mean, 7.8 years).

Results: The patency rate of the gastroepiploic artery graft was 94%, 88%, and 83% in each restudy group. The cumulative patency rate estimated by the Kaplan-Meier method was 96.6% at 1 month, 91.4% at 1 year, 80.5% at 5 years, and 62.5% at 10 years. Causes of late occlusion were primary anastomotic stenosis and anastomosis to a less critically stenosed coronary artery. Once the gastroepiploic artery was perfectly anastomosed to the coronary artery, which has tight stenosis and good runoff, late patency was good, and new stenosis in both the gastroepiploic artery trunk and the anastomotic site was uncommon.

Conclusion: The gastroepiploic artery graft can be used effectively for coronary artery bypass for the long term with proper target selection. (J Thorac Cardiovasc Surg 2000;120:496-8)

To extend the use of arterial conduits for myocardial revascularization, several autologous arteries have been widely investigated and used clinically. Although the right gastroepiploic artery (GEA) graft[1] has over 10 years' history in coronary artery bypass grafting, the late angiographic result is yet unknown. We report late angiographic results obtained with the GEA graft.

Methods

Since March 1986, 936 patients have undergone coronary artery bypass grafting with GEA grafts. There were 812 men and 124 women with a mean age of 62 years. Single, double, triple, and left main disease was noted in 6, 134, 652, and 144 patients, respectively. The mean number of distal anastomoses was 3.3, and the mean number of coronary arteries bypassed with arterial grafts was 2.4. The sites of GEA grafting were the anterior descending artery in 78, the diagonal artery in 7, the circumflex artery in 147, and the right coronary artery in 726 patients. The operative mortality was 1.8% (17 patients). Among the patient population, 685 patients underwent postoperative angiographic restudy within 1 year (mean, 2.2 months), 102 patients were restudied between 1 and 5 years (mean, 2.3 years), and 52 patients were restudied between 5 and 10 years (mean, 7.8 years).

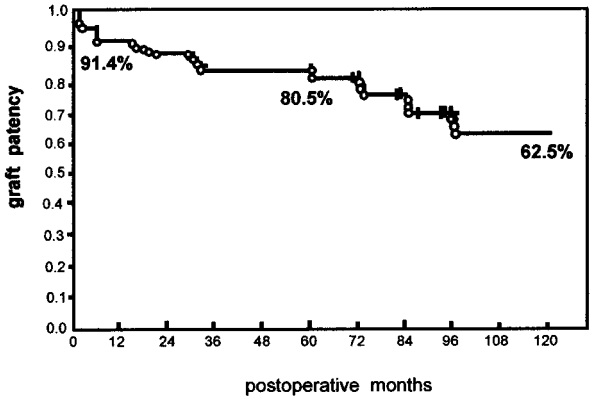

Fig 1. The 10-year cumulative patency rate of the right GEA graft estimated by the Kaplan–Meier method.

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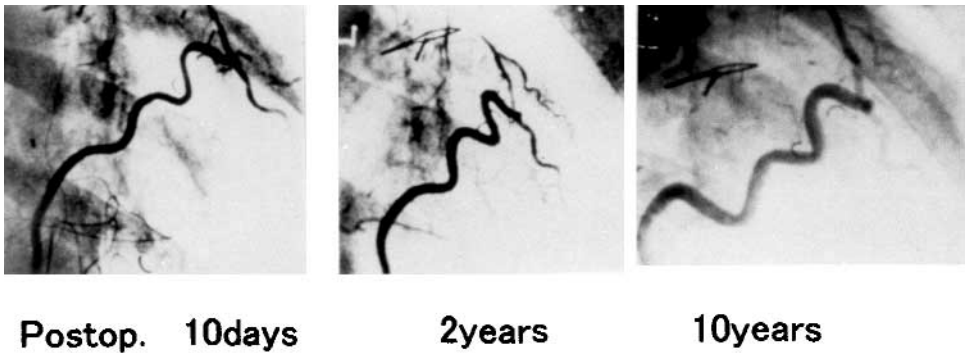

Fig 2. The right GEA anastomosed to the anterior descending artery at reoperation in a 54-year-old man. Postoperative restudy at 10 days, 2 years, and 10 years showed a widely patent GEA graft. *Postop,* Postoperative.

In the late restudy group there were 44 men and 8 women with a mean age of 63 years at the time of restudy. Double, triple, and left main disease was noted in 14, 31, and 7 patients, respectively. The GEA graft was used as an individual in situ graft for all patients. The sites of GEA grafting were 3 anterior descending, 8 circumflex, and 41 right coronary arteries.

Angiographic findings were assessed by responsible cardiologists and cardiac surgeons. The cumulative patency rate was estimated by the Kaplan-Meier method.

Results

The patency rates of the GEA grafts were 94% (644/685), 88% (90/102), and 83% (43/52) in the early, midterm, and late restudy groups, respectively, and the cumulative patency rates were 96.6% at 1 month, 91.4% at 1 year, 80.5% at 5 years, and 62.5% at 10 years (Fig 1).

Causes of graft closure in 41 GEA grafts of the early restudy group were thought to be technical error and anastomosis to distal posterior descending or posterolateral coronary arteries with poor runoff. In 12 GEA grafts that were occluded at midterm restudy, 4 grafts had been anastomosed to less critically stenosed coronary arteries, 5 grafts to small coronary arteries with poor runoff, and 3 grafts to sizable coronary arteries with tight stenoses.

In the late restudy group all 52 patients who had late restudy had undergone early restudy, and the GEA graft had been found to be patent at one time. One graft anastomosed to the right coronary artery with 95% stenosis had shown perfect patency previously, but it disappeared completely in the late restudy. Four other grafts had anastomotic stenosis in the early restudy. The remaining 4 grafts were anastomosed to the large right coronary artery with low-grade proximal stenosis. Those GEA grafts had been visualized through the native right coronary angiogram in a retrograde manner in the early restudy.

As to the GEA grafts found to be patent in the late restudy, a new stenosis occurring both at the anastomotic site and the GEA trunk was uncommon (Fig 2). There was one such case with a 71-year-old woman who had a new stenosis in the GEA trunk 7 years after the operation. She had diabetes, peripheral vascular disease, and a calcified ascending aorta. The patency rate of the internal thoracic artery and the saphenous vein grafts concomitantly used with the GEA in the late restudy group was 94% (62/66) and 68% (30/44), respectively.

Discussion

Several reports have presented a good patency rate of GEA grafting in the early postoperative period.[2-5] The late angiographic patency rate of the GEA graft is, however, still unclear. Vouliluiner and colleagues[6] have shown that the 5-year patency rate was 82.1% (23/28). They noted that in 4 of 5 occluded GEA grafts, the recipient coronary artery had stenosis of less than 70% and supposed that a cause for GEA occlusion was a competitive flow. In our study, postoperative sequential angiograms performed on the same patients showed that when excellent anastomotic patency was obtained in the early restudy, it was unusual to find a new stenosis at both the anastomotic site and the GEA trunk during the late postoperative period. The only exception was the GEA graft anastomosed to the coronary artery, mostly the right coronary artery, which had less critical stenosis. Those GEA grafts often tend to be nonfunctioning because of competitive native flow.

If a suitable target coronary artery and with a good anastomosis is selected, the in situ GEA graft can be expected to be a reliable arterial conduit for the long term.

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